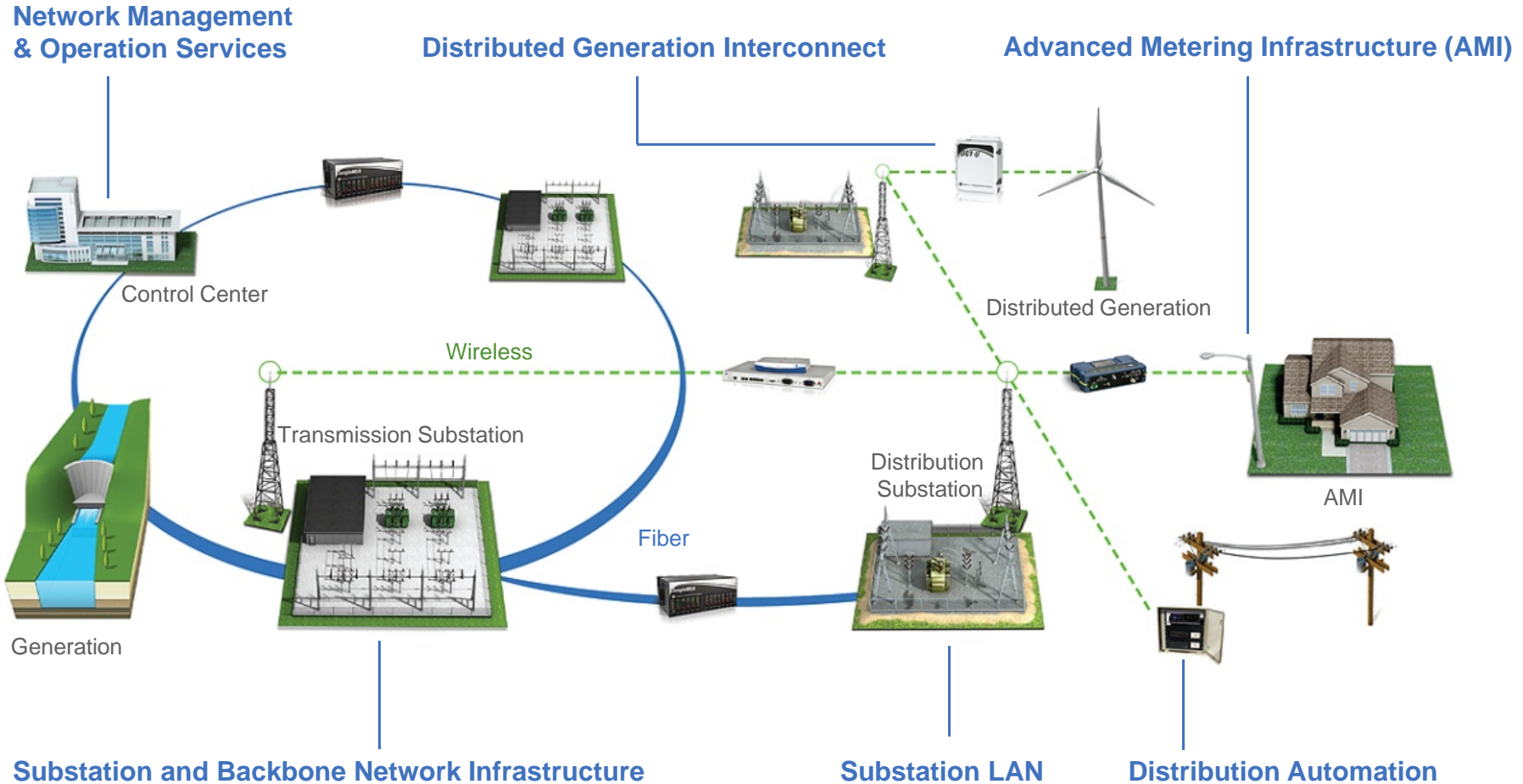# Smart Grid Communications

Digital Energy
Communications

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Smart Grid – Communications Infrastructure

Network Management & Operation Services

Distributed Generation Interconnect

Advanced Metering Infrastructure (AMI)

Control Center

Distributed Generation

Wireless

Generation

Transmission Substation

Fiber

Distribution Substation

AMI

Substation and Backbone Network Infrastructure

Substation LAN

Distribution Automation

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Addressing Communications for the Smart Grid

Self-healing… ensures electric delivery in light of fault conditions by proactively isolating and then re-routing the delivery of electricity

Interactive… enable two-way communication between the consumer and the utility, allowing for more insight, control and choices over demand and costs

Optimized… delivers the intelligent network to monitor and make best decisions on how to effectively utilize assets

Secure… secure network topology for your critical communication infrastructure

Predictive… provide network management, event alarming, ongoing monitoring and root cause analysis to ensure availability

Distributed… information enable remote assets throughout the electric delivery system, supporting automated processes for reliable power.

Integrated… enable a proactive and automated approach to collecting critical information, to enable real-time decision making

Secured Network Infrastructure?

System Reliability

✓Higher Network Availability - during emergencies

✓User Manageable

✓Troubleshooting - Root Cause Analysis

Security

✓Broken chain-of-custody

✓Encryption and Authentication - Layered Cyber Security, NERC CIP

Deterministic

✓Adaptive Latency – Application Dependant

✓High Throughput

✓Management of network traffic loading

✓Single Infrastructure

Life Cycle Costs

✓No Monthly Fees

✓Fast ROI

✓Future Proof - Open Standards Based

✓Leverage existing network infrastructure

Technology

✓Open Standards

✓Field Proven

✓Adoptable

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Addressing Communication Needs

Cyber Security Standards… NERC-CIP

- ✓Parameters for NERC-CIP
- ✓Cyber Assets

Frequency Spectrum for Wireless Networks… Need for Dedicated Spectrum

- ✓Support for UTC
- ✓1.8 GHz band

Open Standards… NOT Open Networks

- ✓Open standards
- ✓Protocols IEC 61850 and DNP-3
- ✓Standard interfaces such as Ethernet and serial